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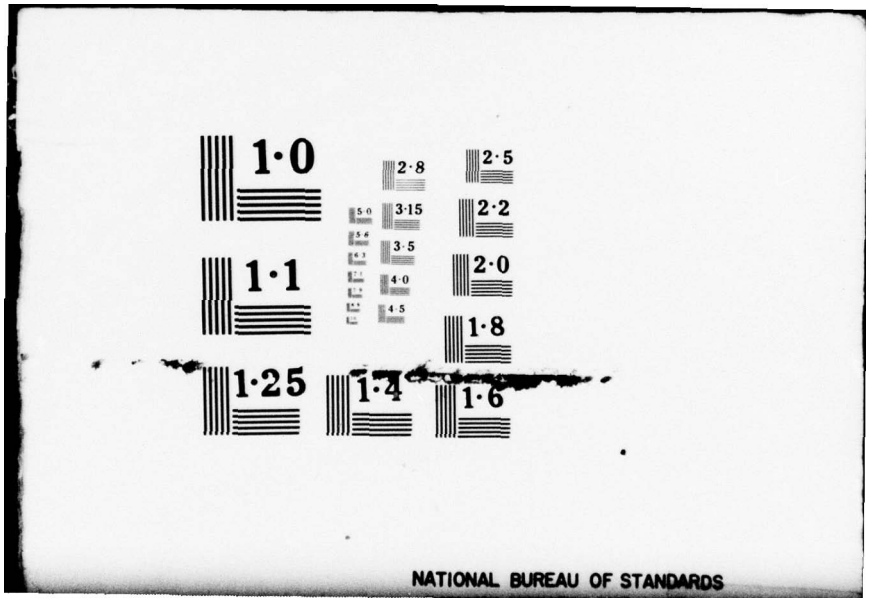
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NATIONAL BUREAU OF STANDARDS

DEFENSE SYSTEMS MANAGEMENT COLLEGE

PROGRAM MANAGEMENT COURSE
INDIVIDUAL STUDY PROGRAM

THE EFFECTS OF MILESTONE 0
ON THE NAVY ACQUISITION PROCESS

STUDY PROJECT REPORT
PMC 77-2

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FORT BELVOIR, VIRGINIA 22060

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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: EFFECTS OF MILESTONE 0 ON THE NAVY ACQUISITION PROCESS

STUDY PROJECT GOALS:

To identify and understand the changes which have been imposed on the Navy acquisition process through the establishment of Milestone 0; to evaluate Navy implementation efforts to date and propose a practical method for compliance.

STUDY REPORT ABSTRACT:
This report outlines the motivating factors behind the DOD formalization of the acquisition conceptual phase. It portrays the Navy's acquisition process and changes which will be required. There is a discussion of the Navy's efforts at compliance and the problems which have been encountered. The report concludes with a general evaluation of the benefits expected to be derived from the new policies and some recommendations for compliance.

SUBJECT DESCRIPTORS:

Program/Project Management, Major Policies (10.02.01)
Milestone 0 (11)

NAME, RANK, SERVICE
Roy L. Linton, GS-13, DNC

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THE EFFECTS OF MILESTONE 0
ON THE NAVY ACQUISITION PROCESS

Individual Study Program

Study Project Report

Prepared as a Formal Report

Defense Systems Management College

Program Managers Course

Class 77-2

by

Roy L. Linton
GS-13 DNC

November 1977

Study Project Advisor
Mr.William H. Cullin

EXECUTIVE SUMMARY

The objectives of this study project were to examine the changes required in Navy weapons system acquisition as a result of the Milestone 0 described in DOD Directive 5000.1, to assess the problems related to these changes, and to provide recommendations for implementing the changes.

The study is focused on the major issues related to implementing Milestone 0 and is thus related primarily to major programs. Germane issues for this study are: a. the requirement for continual mission area analysis to identify service needs; b. the Mission Element Needs Statement (MENS) documentation and processing; c. the required autonomy of the system during the conceptual phase; and d. the requirements for a Program Manager (PM) upon approval of the MENS.

The study report identifies the Navy's major system acquisition process prior to current directives, issues which resulted in the current DOD policies, and the changes which will be required. In addition, there is a brief review of present Navy effort to comply with the requirements for Milestone 0 and the lessons learned. Finally, there is a discussion of the individual problems related to implementing Milestone 0 requirements and an assessment of the anticipated effectiveness versus the objective and philosophy upon which it is based.

The overall objective specified for both OMB Circular A-109 and the resulting DOD policy change was to improve the effectiveness, efficiency and economics of the acquisition

process. It was the conclusion of the writer that Milestone 0 would not be effective in this respect, but that the concept was workable and the services could manage the acquisition process within its framework.

Two recommended approaches for Navy implementation of Milestone 0 are addressed. The first, and most practical, concerns the transformation of the OR into a MENS. The second requires the MENS be a converted Scientific Technical Objective (STO).

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INTRODUCTION

PURPOSE

Navy Acquisitions run the gamut from minor acquisitions such as feeding and clothing servicemen to major weapons systems such as the F-14. Approximately 90% of these procurements are under $10,000.00 but account for only a small percentage of the total procurement expenditures. Therefore, the largest expenditures are for 10% of the procurement programs. Billions of dollars of taxpayers moneys may be expended for a single major acquisition program.

Such large expenditures of the taxpayers money justify the concern and close scrutiny given by Congress to the major acquisition process. However, this scrutiny often leads to changes in the acquisition procedures and too frequently the changes attack the symptoms rather than the actual cause of problems encountered in the process.

Most recent changes directed by higher authority are predominantly aimed at improving the effectiveness and efficiency of procurement during the conceptual phase of the acquisition life cycle. These policy changes have been implemented by DOD Directives 5000.1 and 5000.2 dated January 18, 1977.

The purpose of this paper then, will be to explore the impact of these new DOD Directives 5000.1 and 5000.2 on the Navy acquisition process. Particular attention will be

given to changes necessitated by the implementation of the program. It must be noted that one of the major changes needed is to lower expenditures and shorten overall cost schedules. It is therefore necessary to explore this level to see if indeed a saving of time and/or money will result.

This paper also gives some attention to present Navy compliance with the directives and identifies problems and/or successes which have resulted. There will also be a brief exploration of future implementation requirements and anticipated results.

SCOPE

Although the Naval acquisition process in general is discussed, the scope of this paper is limited to those problems which fall within Acquisition Categories I and II. These programs are those most highly impacted on by current policy changes reflected by the new DOD Directives 5000.1 and 5000.2. The original scope was also planned to encompass only the impact of incorporating the new policy into the Navy's present procurement process. It never occurred to the writer that there might be any question concerning the validity of the current policy changes. Needless to say, the writer was somewhat naive. Interviews with knowledgeable persons and review of many documents gave rise to new questions. Questions not only related to the validity of a Milestone 0 concept as directed by DOD Directives 5000.1 and 5000.2, but also to questions relating to continued piecemealing in lieu of totally overhauling acquisition procedures. Attempting

to shore cost and schedule increases by attacking one and then the other without appropriate consideration for their interrelation and total program impacts could be a large factor of our present problems. Thus, the scope was expanded to include an evaluation of the anticipated effectiveness of the new Directives.

SECTION II

BACKGROUND

GENERAL

This section describes the Navy acquisition procedures in effect at the latest policy change, identifies the reasons leading up to the change, and describes the resultant change in policy.

PRE MILESTONE 0 NAVY ACQUISITION PROCEDURE

OPNAVINST 5000.42A established Navy procedure for R&D planning, identifying operational requirements, and conducting management review during systems acquisition. This instruction applies to all Navy acquisition programs. It addresses the program review process as the principal means of monitoring the acquisition programs, and assigns the review and decisions authority for each program category. (1:1)[1] Programs are divided into four Acquisition Categories (ACATs) to facilitate effective management and review. The specific level of decision authority and specific acquisition procedures and responsibilities assigned for each category are as follows:

1. ACAT I - This category coincides with DOD Directive 5000.1 (Major Systems Acquisitions) "major program" designation. Programs in this category are designated by SECDEF based on recommendations by DOD Component Heads or OSD

[1]This reference will be used throughout this report to identify bibliographical sources. The first number indicates the reference number and the second number is the page number in the reference.

Officials. The primary consideration in such a designation is program cost, $75 million in Research, Development, Test and Evaluation (RDT&E) or $300 million in production funds. The decision authority for ACAT I is the SECDEF/DEPSECDEF.

2. ACAT II - This category includes three types of programs:

a. Secretary of the Navy (SECNAV) designated programs for which SECNAV is the decision authority.

b. Programs with an estimated RDT&E cost of between $20 and $75 million or an estimated production cost of between $50 and $300 million. This includes programs designated by CNO, CNP, Director of Navy Program Planning, Director of RDT&E or Program Sponsors. For these programs the CNO is the decision authority.

c. Ship acquisition programs not requiring DSARC review. CNO serves as the decision authority. (2:8)

3. ACAT III - Programs below the ACAT II level which have estimated RDT&E costs between $5 and $20 million and estimated production costs between $20 and $50 million are included. In addition, programs designated by CNO or the Developing Agency (DA) may be ACAT III. Programs which fall below ACAT II funding thresholds but which directly affect the military characteristics of ships and aircraft, and which require Operational Test and Evaluation (OT&E) or fleet RDT&E support are designated ACAT III. The decision authority is the program sponsor.

4. ACAT IV - This category includes all programs not

in ACAT I, II or III. The Chief of Naval Material (CNM) or his designated subordinate serves as the decision authority. (2:9)

Further discussions of the Navy Acquisition Process herein will be limited to the processes most effected by the new DOD Directives 5000.1 and 5000.2 of January 18, 1977. This is the ACAT I procurement process to DSARC at Milestone I.

This process is depicted by Figure 1 and described in the following statements.

Originating requirements for all Navy acquisitions are documented on a Operational Requirement (OR). It is a concise statement concerning needed operational capabilities for the near and mid-term (0-10 years). The OR usually originates within OPNAV but drafts may be submitted by any command to the cognizant forces and Mission Sponsor in OPNAV with copies to CNO DDR&E. The OR is limited to three (3) pages in the format described in OPNAVINST 5000.42. After approval by appropriate CNO authorities, the OR is directed to the Naval Material Command or Bureaus for comprehensive studies and the preparation of a Development Proposal (DP). (1:4)

A DP is the formal response to an OPNAV OR. It presents the results of the technical studies and states recommended alternatives and/or objectives that might satisfy operational need.

The DP is not limited to one solution for a need, thereby giving necessary information to make effectiveness and operational comparisons.

The DP should also list briefly any uncertainties to

DOCUMENTATION AND REVIEW PROCEDURE

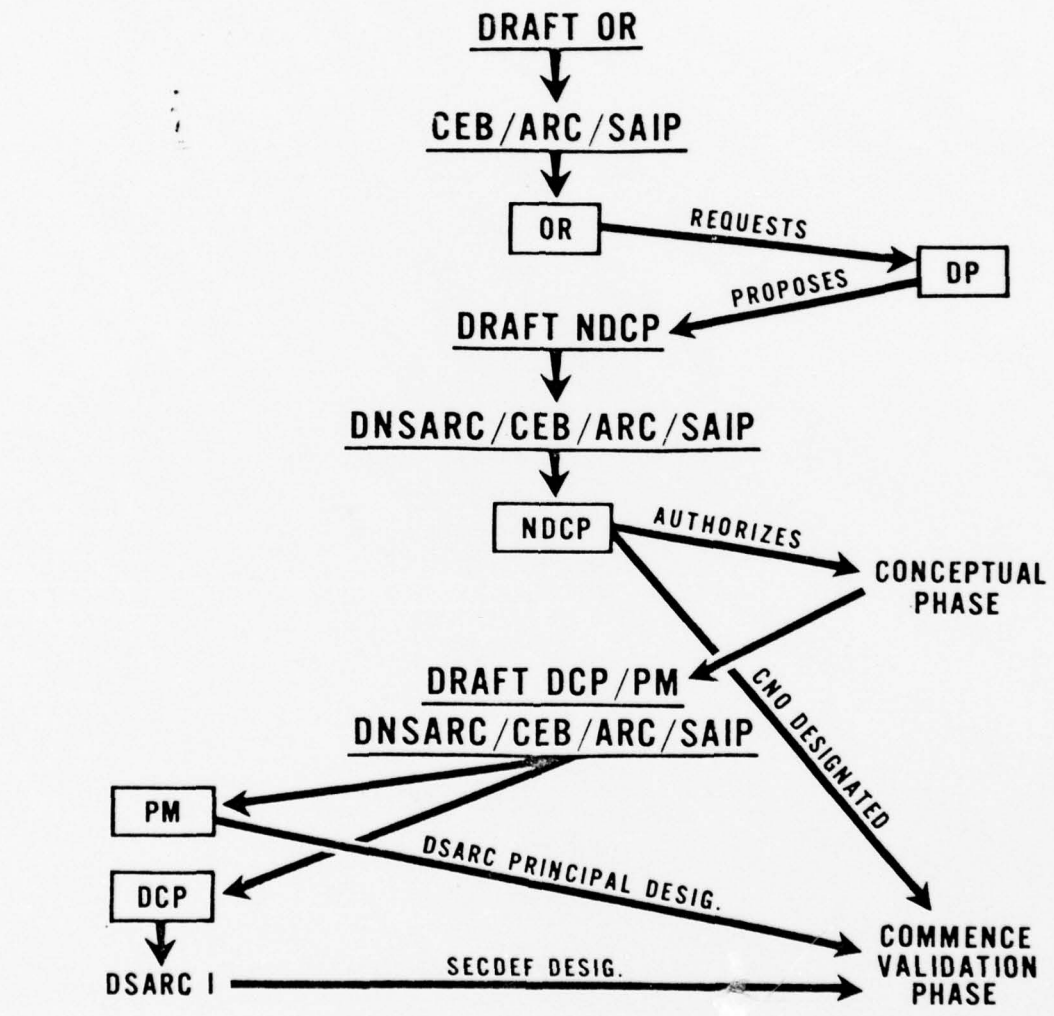

Figure 1

be resolved, such as schedule risks, and should give an indication of other on-going or proposed related programs including those of other services.

In its completed phase, the DP returns to OPNAV the information set forth above, along with a rationale for selection of the solution recommended by CNM. The OR provides the basis for the Naval Decision Coordination Paper (NDCP). (1:5)

The NDCP is prepared by the OPNAV Force/Mission Sponsor from the DP and is the basic document for Navy program approval and control. The NDCP defines program issues, program objectives and plans, considerations which support the operational need, performance parameters, areas of risk and development alternatives. (1:5)

For CNO and SECNAV designated programs, the NDCP is the final document to be prepared for approval and is updated for program reviews at designated milestones.

For other designated programs, the NDCP approval authorizes only extended systems planning and conceptual effort until approval by a higher authority is given.

Under all circumstances, the NDCP contains all information required by the DCP or Program Memorandum (PM). An approved NDCP as a response to a DP represents the first commitment of OPNAV RDT&E resources.

From the NDCP, a Development Coordinating Paper (DCP) is derived for major milestone decisions in the life of a major program. The DCP is reviewed by the DSARC who makes recommendations to the Secretary of Defense. The DCP/DSARC

process is used only in designated major programs but similar review and decision procedures are employed for the programs below the major program level.

The DCP is prepared to consolidate all of the issues and establish agreement, and once approved by SECDEF, it represents a contract between the SECDEF and the service. The DCP is developed through cooperation with DDR&E, the principal developing activity, CNM and CNO to reach a common view of objectives or agreement on the issues.

Normally, DCP decisions are made four (4) times in the life of a major program. These four times are: 1) DSARC I - Program Initiation Decision; 2) DSARC II - Initiation of full scale development; 3) DSARC IIB - Initiation of limited (pilot) production and 4) DSARC III - Major production decision. There may be other DCP review periods such as when DCP thresholds have a breach or there may often be two or more DSARC reviews at level 4 (DSARC III).

When a DCP is not required, a Program Memorandum (PM) serves the same purpose for certain non-major acquisition programs. The PM is also derived from the NDCP and serves as a document for approval and control of the program. Basically, the PM is the same as the DCP in content and format, but the PM is used in lieu of the DCP in certain programs designated by DDR&E or another DSARC principal. (3:266)

BACKGROUND OF CHANGE

The present systems acquisition procedures as reflected in the current DOD Directives 5000.1 and 5000.2 have been

developed through evolution and response to a continuous series of criticism and study resulting from the cost, technical performance and schedule difficulties experienced by past programs. The emphasis on front-end structuring which is the main thrust of Milestone 0 is the result of many study reports. Significant points of these documents which influenced the current directives provide a starting point for understanding the associated issues. Some of the more important are summarized in the following paragraphs.

a. Commission on Government Procurement. The Commission was created by public law in November 1966 by Congress to study and recommend methods for more economical, efficient and effective procurement. Some of the more pertinent areas of concern identified by the Commission were:

1. The total absence of visibility on decisions controlling the purpose and direction of acquisition programs. (4:70)

2. The defense requirements documents state need in terms of a proposed solution rather than the defense problem. (4:97)

3. Each service separately defines its own needs without overall coordination by the Department of Defense. (4:97) There is a chance that an unneeded system could be developed or that a system could be acquired which has an overlapping function or capability with a system owned by a sister service.

4. There is a premature commitment to a system

concept and preliminary design resulting from the need statement; consequently, other viable system concepts may not be considered or given a fair evaluation. (4:114)

The Commission recommendations related to these findings provided the basis for the policy promulgated by OMB Circular A-109. As the pertinent recommendations are duplicative of the requirements identified under OMB Circular 109, they will not be separately addressed herein. If review is desired, they can be found in Volume 2, Part C, pages 69-187 of the COGP report.

b. Acquisition Advisory Group. In April, 1975, the Deputy Secretary of Defense chartered the Acquisition Advisory Group (AAG). Its primary purpose was to examine and assess recommendations made by the services concerning Secretary of Defense guidelines pertaining to major program issues. The AAG report deals with a broad range of acquisition process issues. Those impacting the changes in current policy Directives are summarized as:

1. The AAG highlighted the need to strengthen line management in systems acquisition; the difference between line and staff responsibilities and authority; and it held the Service Secretaries accountable for appointment of qualified individuals in the acquisition process.

2. The AAG contended that the requirements formulation and documentation process should not be over-formalized. Rather, it said there were clear benefits in providing a process and atmosphere that would allow innovation and

creativity in the early stages of a new system as well as judgmental latitude in making evolutionary improvements to existing systems. (5:33)

3. The AAG concluded that there are two types of analyses needed to support the formative stages of the acquisition process: (1) a mission area analysis to define deficiencies relative to countering a projected threat; and (2) mission concept studies to define solutions to the expected credibility gap. The end result could be a service proposed acquisition program. (5:36)

c. OMB Circular A-109. This Executive Branch circular dated April 5, 1976 establishes the policies for the acquisition of major systems and implements recommendations from the Commission on Government Procurement. (6:1) The new policy is intended to effect reforms to improve the general effectiveness and economy of the acquisition process. The general policy which must be applied by the Department of Defense (DOD) is:

1. To express needs in mission terms and not equipment capabilities to foster creativity and competition. The initial activities of the acquisition process should be emphasized so that alternative concepts can be examined to fulfill the mission need. (6:3)

2. The DOD should plan future system acquisitions based on an analysis of its mission and an appropriate resource investment. (6:4)

3. There should be a clear decision point where

the Secretary of Defense verifies the mission deficiency and validates the need based on overall capabilities, priorities and resources. A valid need may be caused by existing capabilities or a technological opportunity. (6:7)

4. Communicate with Congress early by relating programs to mission needs.

5. Establish clear lines of authority, responsibility and accountability for management and utilize appropriate managerial levels in decision making. (6:6)

d. Common Emphasis. The common thread of emphasis for these studies concerns the process of activities in the formative stages of a new development program and the accountability for the policy changes reflected in the current DOD Directives 5000.1 and 5000.2.

POLICY CHANGE

DOD Directive 5000.1 of January 18, 1977 contains present DOD policy pertaining to the acquisition of major weapon systems.

Under former editions of this directive, the initial phase (Conceptual Phase) in the system life cycle was conducted at the discretion of the service. The conceptual phase was terminated with an advanced systems concept which was approved by the service. The service approved concept was them submitted at Milestone I to the Secretary of Defense via DSARC for approval to enter into the second phase of the life cycle (Validation Phase). Milestone I approval was the first formal requirement for involvement by the

Secretary of Defense. (7:2)

The current issues of DOD Directive 5000.1 and DOD Directive 5000.2 require substantial change in the structure of phase one. The conceptual phase is no longer conducted at the discretion of the service. There is now a very formalized beginning, Milestone 0, which requires Secretary of Defense approval prior to entering into or expending any funds for the conceptual phase. Obtaining the approval of the Secretary of Defense at Milestone 0, likes Milestones I, II and III is to be a very structured process. It requires the preparation of a Mission Element Needs Statement (MENS), the purpose of which is to coordinate service requirements with element needs. (8:3).

Preparation of a MENS will be based upon service mission capability need identified by a continuous mission area analysis process conducted by the service. As perceived needs are identified through analysis, those which are anticipated to require major systems acquisition must be documented in a MENS. The need will be documented in terms of an operational deficiency to perform an assigned mission rather than as a system hardware capability requirement. The MENS will then become an official request, processed through the service to the Secretary of Defense for approval to explore alternate solutions to the stated need. (9:3)

The Secretary of Defense examines the proposed need in terms of defense policy resources, total force structure, and current environmental factors. Approval of the MENS

at Milestone 0 provides the formal authority to initiate a conceptual phase. (8:3)

In addition to establishing Milestone 0, two other policy positions are identified. First, the conceptual phase shall be conducted on a broad basis. Potential solutions shall be open-ended and evaluation of alternatives shall not be oriented to any particular hardware system. Second, upon approval of the MENS at Milestone 0, the Service Secretary is charged with the responsibility of immediately naming a Program Manager (PM), establishing a formal charter for the PM, and providing a source of funds to conduct an examination of alternative concepts. In the past, the selection and chartering of a PM would not occur this early or prior to system identification. (8:5)

SECTION III

CURRENT STATUS

ATTEMPTS

To date, the Navy has two MENS in process and several others on the drawing board. At the time of this writing only one of these MENS has gone forward to the Secretary of Defense. The other was still under review by the Navy. The MENS which was sent to the Secretary of Defense was for the TYPE A V/STOL Program. This program has been in process for some time as an advanced technology demonstration. The original mission needs statement was prepared prior to current DOD Directives. It was developed as a result of the OMB Circular requirements and the knowledge that DOD Directives were in process. This statement was approved and signed by Secretary of Defense Clements on January 20, 1977, two days subsequent to the signing of the new DOD Directives. As a result of approval, the program was designated for conceptual development. (10) However, with the change of Secretaries of Defense, Secretary Brown signed a memorandum to the Secretary of the Navy on April 1, 1977, revoking approval. The memorandum stated that the original mission analysis was unsatisfactory. It specified that this did not withdraw support of Navy efforts to explore the technical and mission potential of the system, but that detailed MENS should be submitted at least thirty working days in advance of planned RFP release dates. The memorandum identified the additional

information to be submitted and provided an outline for the documents. It requested a Mission Needs Statement (MNS) for two broad missions and a MENS for each mission element envisioned as potential application for the system. (11:1) The enclosed outlines of the MNS and MENS are provided as Appendices I and II to this report.

The Secretary of the Navy took exception to the suggested degree of DOD involvement in determining equipment requirements and to the voluminous work required. He signed a memorandum to the Secretary of Defense on July 29, 1977 specifying his concurrance with the intent of the current DOD Directives but not the current application. He provided the following recommendations as a solution:

> "a. Write a MENS for each major acquisition to relate to mission structure as set forth in NWP-1,...
> b. Address in the MENS the deficiency in capability and/or the potential benefit from the application of specific technology which justifies initiation of a program.
> c. Provide in the MENS, guidance for systems concepts which is sufficiently definitive to ensure feasible alternative approaches, but broad enough to avoid foreclosing potential solutions." (12:1)

At the time of this writing, formal reply had not been received by the Secretary of the Navy, and the Navy was proceding as outlined by the Secretary of the Navy Memorandum. The latest version of the MENS was prepared accordingly and is under review by the Navy for submission to the Secretary of Defense.

LESSONS LEARNED

Unfortunately at this time the lessons learned by the Navy have all been what not to do. The concept is still new and procedures and documentation are soft. Successful transition from concept to practice is still to be achieved.

The one thing the Navy has discovered is that the actual application is not as simple or smooth as the Directives indicate. With the formation of the conceptual phase has come a considerable increase in higher level involvement with a commensurate workload for the Navy.

ISSUES AND PROBLEMS

When this paper began, it was intended to encompass the identification and resolution of problems related only to implementation of the policy and procedures expressed by the new DOD Directives 5000.1 and 5000.2.

However, after discussing current policy problems with several knowledgeable persons and reviewing an extensive amount of related documentation, I began to have serious reservations about the problems I had identified for evaluation and analysis. I violated the cardinal rule of any evaluation/analysis of a problem; I assumed (never assume) that I was starting on a sound foundation in the DOD implementation of OMB Circular A-109. I have since arrived at the conclusion this was a mistake and have added one more problem to the list: Do the current DOD Directives achieve the objective of OMB Circular A-109? This is a problem which I feel overshadows the others and would have been first but for my own

shortsightedness.

Major Acquisition programs are to be initiated with the approval of a Mission Element Needs Statement (MENS). Development of the MENS is to be based upon the justification of a mission element need through continuing mission area analysis by the services. The delegation of mission areas to the services will be a Secretary of Defense responsibility. However, the current policy does not define the scope, content, and boundaries for mission areas, but leaves it as a future SECDEF task to be accomplished via the Defense Guidance Memorandum and Program Policy Guidance Memorandum.

PROBLEM: How, by whom and when the mission analysis will be done.

The MENS is to define mission needs without describing or suggesting a system or hardware to fulfill that need. The purpose to this system autonomy is to maximise available alternatives for needs satisfaction. In the past, the Navy has used the OR to initiate a service acquisition. While the OR is based upon threat and mission analysis, it does describe some system requirements. In addition, the processing of the OR is accomplished under the auspices of an OPNAV sponsor for a given mission area. The assignment of the mission sponsor could be viewed as somewhat akin to describing the platform or system required.

PROBLEM: Will the OR continue and, if so, how will it relate to the MENS.

The current policy expressed in DOD 5000.1 requires a

PM to be designated upon approval of the MENS at Milestone 0. Policy also dictates that the system autonomy be maintained through the conceptual phase, identifying systems only at the validation phase. The solcitation for proposed solutions must enable all sources to fully respond.

In the past, the Conceptual Phase was performed through a hardware activity related to the anticipated system. PMs were selected from the community for their knowledge in the system area as well as their PM ability. It is in fact Navy policy for example, that a PM for an aircraft be an aviator.

PROBLEM: Selection of PMs and their associated command prior to system identification.

The thrust of the current policy directives is compliance with the requirements of OMB Circular A-109. This circular resulted from severe criticism of government acquisition cost overruns, schedule slippages, and general waste. The Circular promulgated specific requirements for improving the efficiency, effectiveness and economy of major systems acquisition. Current DOD Directives which implement this circular center around a structured conceptual phase and increased management emphasis. The requirements for mission analysis, the MENS Milestone 0, system autonomy, and increased PM responsibility reflect this view.

The philosophy behind the current directives is very sound; however, the application might be self-defeating. Increased program structuring and management along with firm rules regarding program decision can easily lead to increased

review and decision time with less program flexibility. These conditions may be counter-productive.

PROBLEM: Achieving improved efficiency and economy in systems acquisition through the current DOD Directives.

SECTION IV

DISCUSSION OF PROBLEM AREAS

MISSION ANALYSIS

The purpose for continuing mission analysis is to identify those mission elements for which existing or projected capabilities are deficient and to identify opportunities for the enhancement of capabilities. The Secretary of Defense is to establish mission areas and the service is to establish procedures for the continuing analysis of its assigned mission areas.

In his memorandum to the Secretary of Dfense dated July 29, 1977, the Secretary of the Navy stated:

> "Central to achieving an acceptable system is definition of both relevant mission structure and the content of a MENS. We believe the Navy missions themselves are adequately defined in Title 10, U.S. Code, DOD Directive 5100.1 and NWP-1 (Strategic Concepts of the U.S. Navy). Further definition of Navy and Marine Corps missions at this time would appear to be unnecessary." (12:1)

The requirement for mission analysis to identify requirements is not new to the Navy. It is and has been an integral part of normal planning and documentation process. OPNAVINST 5000.42A has identified this requirement as the basis for an OR for several years. In addition, threat support to weapons systems selection and planning is required and identified by OPNAVINST 3811.1. (13:1) With the Navy's prior view on mission analysis and accepting the Secretary of the Navy view on mission analysis, this requirement poses

no problem. The same procedure will be utilized as that for the OR.

OR vs. MENS

The OR is the formal document utilized within the Navy to identify procurement requirements. It is prepared by OPNAV, but draft ORs may be prepared by any fleet activity or Navy command and submitted by the chain of command to the cognizant CNO Resource and Mission Sponsor. The ORs, after reviewal and approval by appropriate CNO authorities, are forwarded to the CNM or Bureaus for the Conceptual Phase effort.

Fundamentally, aside from the review and approval process, the OR concept is very similar to that expressed for the MENS. The OR requires a mission analysis for the identification of operational needs, however, the OR also reflects hardware needs. It requires definition of how the system is to be used and requires identification of performance goals. If required, it could be converted to a MENS rather easily by omitting those parts oriented toward hardware requirements. No additional information would be required. Most ORs are not for major programs and would not require conversion. Thus, the present OR system sould be continued with the exception of those for major weapon systems. For these systems a MENS could be utilized and processed in accordance with current directives. (14)

PM vs. SYSTEMS AUTONOMY

The current DOD policy directives require the services

to assign and charter a PM upon program approval at Milestone 0. Conversely, this new policy directs the conceptual phase remain openended in regard to system identification, description and requirements. The conceptual phase is to be conducted solely on the basis of a mission need without regard to type of hardware to satisfy this need. In addition, PMs should not be changed until Milestone I.

The objectives are to maximise management with the focal point concept of the program manager and to achieve the benefits of maximum competition and ingenuity which should result from the flexibility afforded the development of alternatives.

The Navy program initiation is under the auspices of an OPNAV mission sponsor who coordinates the entire effort. When an OR is concurred with by a cognizant sponsor, it is promulgated by CNO DRDT&E. CNM, through the appropriate systems command and through an iterative process of evaluation and constant dialogue with the OPNAV sponsor will respond with a DP.

The program manager operates under a charter issued by the Chief of Naval Material or by the Commander of a Systems Command. Generally, when a critical interface exists with other services or between Systems Commands, the CNM will designate the project and the PM will report to him. When the work of the project falls predominantly within one systems command, the Charter will be issued by the Systems Commander and the project manager will report to him.

At first thought, it might appear that this approach complies with the new policy. However, one needs only take a slightly closer look to discover that the autonomy of the system is seriously compromised. This occurs by the selection of the PM within a systems command and by the sponsor who is somewhat systems oriented. It is not feasible that NAVAIR and OPNAV 5 would propose a ship to air missle for an air superiority requirement.

To maintain system autonomy would require an entirely different approach at both coordinating the OR to DP process and selecting the PM. This might be accomplished by maintaining the MENS under the auspices of DRDT&E who, with a CNM program manager, could utilize the Naval Laboratory for coordinating the evaluation. (15)

EFFECTIVENESS OF MILESTONE 0

The question concerning the value of Milestone 0 is not one of concept, for the writer supports the concept wholeheartedly. Rather, it is a question of application.

The Navy approach to a major systems acquisition from the formulation of an OR to Milestone I was discussed in Section II of this report, however, one should not really construe the OR as the true beginning of the acquisition of a major system. To fully understand the entire conceptual aspects of a major system, one should understand the relation between long-range planning, R&D, and systems acquisition. As practiced by the Navy, this procedure implements the laudable theory of directing and channeling R&D efforts to

support projections of long term Navy needs and then, utilizing this R&D technology as a basis upon which to build new weapons systems when mission need and the available technology coincide. The function of tailoring R&D in relation to long-range Navy needs is illustrated by Figure 2. (3:236) It should be noted that basic R&D, R&D advanced technology, and R&D for some conceptual analyses are all overlapping and interrelated. Presently, there is no clear starting point for identifying a weapon system beginning. The process is evolutionary. To maintain the system autonomy would require the MENS be developed earlier in the R&D cycle than is an OR. Thus, while commitment to a particular system is negated, earlier commitment to develop a major system is indicated. This earlier commitment and the formal structuring requirements of the new policy directives can produce considerable adverse effect on the acquisition process.

Earlier identification of a system would require segregating what could have been general R&D to specific R&D for a specific program. This could produce less coordination of total R&D and a potential loss of base technology through redundant effort. In addition, it could put us back into a situation of system design requirements dictating R&D technology development.

In formalizing earlier commitment to a major system and requiring the Secretary of Defense approval to proceed, another aspect of the system can't be overlooked. With major defense contracts becoming fewer and farther apart, the defense industries

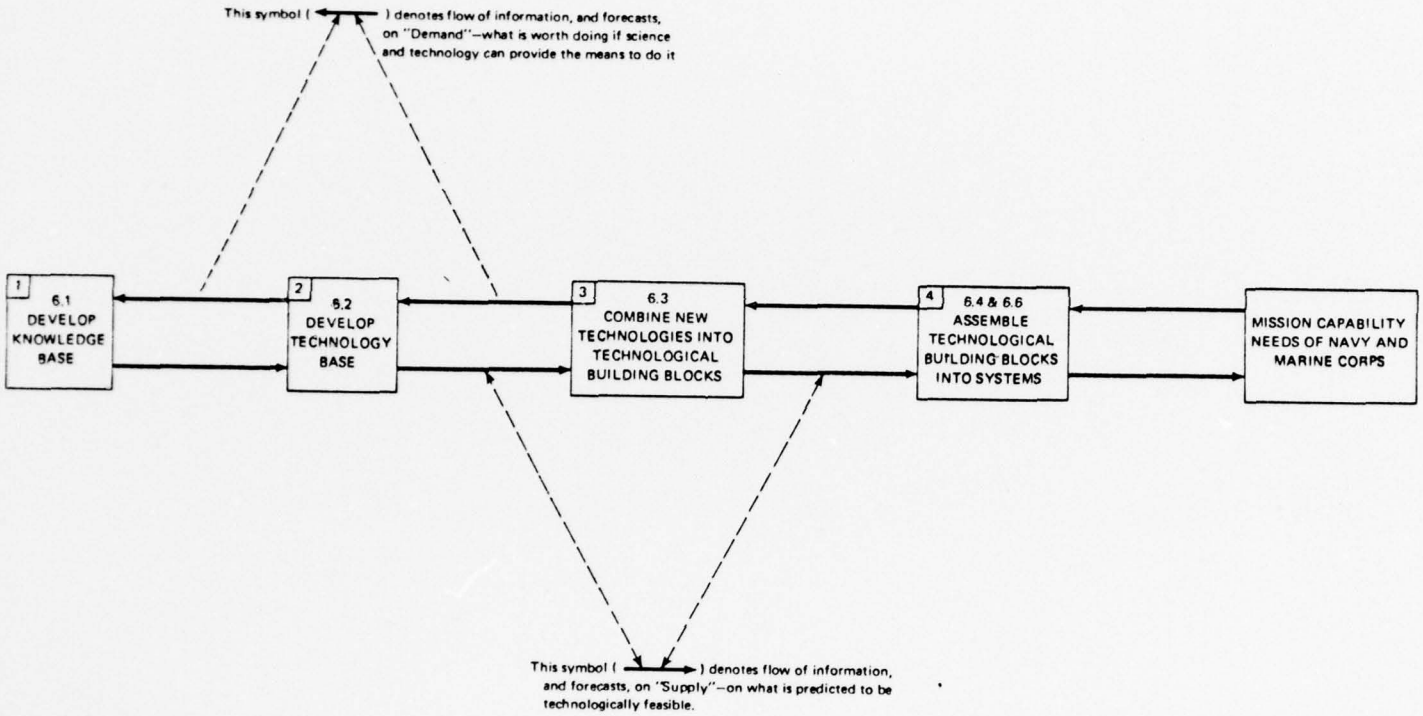

Figure 2--- Functional View of the Defense RDT&E Process

are having greater difficulties obtaining the business needed to survive. Most are willing to buy in on any premise, hoping to get well through a variety of techniques. In addition, each service feels that it is falling further and further behind in its defense posture and may often accept a less that satisfactory package to keep from losing the whole program. Thus, once a MENS is approved the probability of either the contractors or the services relinquishing this opportunity to field a new system is extremely remote. This realism, combined with the increased technological risk of earlier commitment, reinforces the adverse effect of an already undesirable circumstance.

The last factor to be considered in evaluating the value of Milestone 0 is its effect on the Ultimate Risk in procurement of a major system. This is risk produced by moving so slowly as to be overcome by events and is reflected by a final product produced at execessive cost with inadequate performance in or near its obsolescence.

The Ultimate Risk concept as expressed herein, is founded on the ultimate program effect of what appears to be immediate cost, time, and performance savings techniques. It is also a direct factor of attacks on one of the three major parameters (cost, schedule, and technical performance), without proper consideration of their interaction. All of these are risk adverse approaches having near and far effect. Too often, we establish hard rules for near effect without total consideration of the long-range effect. Examples of this thinking are: concurrency is not allowed; risk must

be negated before proceding to the next step; and spreading the dollars on the program's high risk areas prior to commitment. All of which are praise-worthy approaches, but as being applied can create more risk than is being eliminated. They are factors which can have very adverse program impact and which a well trained PM must consider and trade-off along with many other program factors. They cannot be applied as "don't" rules from higher authority. Program interruptions and schedule changes cost money, time and performance. They cost for the built in slippage factors; the effort to make up the slippage; the inflation costs of producing in a later year; and they cost in years of useage (we seldom wear out systems any longer, their capabilities are overcome by technical obsolescence).

To reduce the Ultimate Risk, milestones and decisions should not be applied to all programs at the same point in the same manner. Decisions and decision points should be decided by a comparison of the expected value of the action to the cost of the action in inflation, obsolescence, and lost productivity.

From the above, it can be readily determined that the Ultimate Risk is directly related to the numbers of program decision points, decision makers and risk adverse actions taken. Comparing this concept with the experience of the Navy in its efforts to implement the concept for the Type A V/STOL program, one can only assume that, as with the application of Milestones I, II and III, this application of formality

to Milestone 0 will have a significant adverse impact on the Ultimate Risk.

SECTION IV

SUMMARY

CONCLUSIONS

After careful consideration of the problems and discussions herein, one arrives at the conclusion that the philosophy behind the current policy changes is very sound; however, its application leaves much to be desired.

Mission needs should be the driving factor in determining acquisitions and expenditures of public funds should be closely monitored. Monitoring, however, should be tailored to each program. It should not be conducted on a predetermined basis. Program review and decisions by higher authorities should not result in higher expenditures. They must be related to the ultimate risk as well as the current risk.

Past experience indicates that Milestone 0, while based upon sound concepts, will not produce the desired effect but will instead increase program life cycle development and cost. This will be due largely to the Ultimate Risk involved with the structural formality and its resultant administrative impact on the programs. However, the writer has concluded that, though not effective, the system is workable and has thus provided some alternatives for compliance.

RECOMMENDATIONS

Two alternate solutions have been conceived for implementation of current major systems acquisition philosophy. Along with the major advantages and disadvantages of each, they are presented in the authors perceived order of

desirability. They represent compliance with current policy instructions and mandates as applied to date.

Compromise Approach: Systems requirements or needs based on mission analysis is already in practice within the Navy acquisition process. The current policy poses no problem in this respect. What could create a problem, if pushed sufficiently, is the requirement for system autonomy during the conceptual phase. The question becomes, how much system autonomy must be maintained. The Navy should take a position of reasonableness, attempting to keep the systems concepts as open and objective as possible by direction. This would allow for the easiest incorporation of current policy into the Navy acquisition process.

Incorporation of current policy could be accomplished within the present acquisition process framework by utilizing a MENS in lieu of an OR for those acquisitions requiring Secretary of Defense approval. An OR could continue to be used for all other acquisitions. The MENS when required should be prepared and processed jointly by CNO DRDT&E and the proposed mission sponsor. After approval, the MENS would be directed to CNM who, under the direction of the mission sponsor, would designate and charter a program manager. Systems concept alternatives would be kept open by directions and the remainder of the process would function normally.

The primary advantage to this approach is its ease of implementation. It requires a minimum of present process

change and should effectively incorporate current policy directives.

The primary disadvantage is its subjectivity to questions concerning the effectiveness with which system autonomy is maintained during the conceptual phase. This could become suspect by the use of a platform oriented mission sponsor and the converted OR.

Full Compliance: Full compliance with the intent and letter of present instructions would be most practically accomplished by substituting the MENS for the Science Technology Objective (STO) when a major system requirement was indicated. Using the STO would better preserve the autonomy of the system and provide the lead time required to field the system. The entire conceptual phase effort would be under the auspices of CNO DRDT&E who would be responsible for the mission analysis and MENS preparation. After MENS approval by the Secretary of Defense, the actual conceptual phase effort would be directed by CNO DPDT&E to the CNM. CNM would assign and charter a PM under Mat 03. The PM, utilizing the appropriate Naval Laboratories for assistance, would complete the conceptual phase. Upon completion of this phase, approval at Milestone I, and identification of a particular system to be developed, the remainder of the acquisition process would be conducted under past procedures. This would mean conducting the remainder of the program under the auspices of the appropriate CNO mission sponsor. CNM would assign the acquisition to the appropriate systems

command and recharter another PM.

The advantage to this approach would be its acceptance to higher levels. It most fully maintains the autonomy of the system and would:

a. reduce any investment in the system prior to the Secretary of Defense approval;

b. most nearly provide a PM without bias for the early stages of the conceptual phase.

The predominate disadvantages of this approach are:

a. the reluctance of the industries or the service to be denied after early approval of the development;

b. equipment requirements dictating research and development;

c. loss in continuity of research and development by removing from the R&D mainstreams those portions and efforts committed to a major system;

d. split responsibility for systems development with the necessity to change all of the players at Milestone I;

e. the ultimate risk increases due to longer schedules, more decision makers and the earlier development commitment.

APPENDIX I

OUTLINE FOR
MISSION NEED STATEMENTS

I. MISSION

Describe the mission in terms of the policy objectives it serves and the capabilities needed to do so. Cite basis in statute and directive Describe specific importance to achievement of U.S./NATO objectives in a Case 1 scenario.

II. THREAT

Cite Soviet statements (from Soviet Military Strategy or other authoritative sources) which define their intentions and general approach relative to this mission area. List relevant existing and projected Soviet and Warsaw Pact force and support components and briefly describe how each contributes to the threat. Discuss the principal strategic factors which favor and constrain the Soviet and Warsaw Pact threat in this mission area. Explicitly discuss the Soviet nuclear threat in this mission area (including any possibilities of tactical employment of nuclear weapons) and the various intrinsic and extrinsic factors which might encourage or discourage its use. Describe any relevant third-country threats in this mission area.

III. EXISTING AND PLANNED CAPABILITIES

List existing U.S. (including other-service) and allied force and support components which contribute to this mission area and describe the nature of the contribution made by each. Summarize the projected course of operations in a Case 1 conflict as they pertain to this mission area, based on the results of the most current and authoritative agreed analyses and exercise results. Discuss the uncertainties, risks, and deficiencies concerning our capabilities in this mission area, particularly in a Case 1 scenario.

IV. ASSESSMENT

Assess our quantitative and qualitative needs for capability in this mission area as clearly and precisely as possible. Where room exists for disagreement or difference of informed opinion concerning needs, the various possible positions should be presented, with the arguments for and implications of each.

V. IMPACT OF STAYING WITH THE PRESENT CAPABILITY

Describe in specific terms the impact of staying with our present posture in this mission area.

APPENDIX II

OUTLINE FOR
MISSION ELEMENT NEED STATEMENTS

I. MISSION

A. Mission Area. Identify the broad mission area. For Navy mission elements the mission area will normally be sea control and/or sea power projection. Refer to the appropriate MNS.

B. Mission Element Need Task. Describe the specific mission task in terms of functions and capabilities. Relate specifically to higher-level overall mission area needs. Descriptions in terms of hardware characteristics, or in terms of the need to replace some existing system, are not appropriate.

II. THREAT

Assess the projected threat against which the capability is required through the time that the new capability would be in the field. Quantify the threat in terms of numbers and capability, wherever possible Where appropriate, the threat may be divided into the target threat, the targets (if any) against which the capabilities specified by this MENS are to be directed, and the denial threat, the threat (if any) which may operate to prevent the mission tasks from being accomplished.

III. EXISTING AND PLANNED CAPABILITIES TO ACCOMPLISH THIS MISSION ELEMENT NEED TASK

Identify the existing DoD and Allied capability to accomplish the mission. Where other services or allies have no capability this should be explicitly stated, in each case.

IV. ASSESSMENT

Assess the need in one or more of the following terms:

— Specific deficiency in the existing capability;

— Technological opportunity;

— Inadequacy of force size to meet threat;

-- Opportunity for life-cycle cost savings;

— or others as appropriate.

V. CONSTRAINTS

A. Development costs -- budget wedges

B. Operational and procurement costs to include manpower based upon a like recent buy of the same type capability

C. Logistics considerations

D. NATO standardization/commonality

E. Other budget wedges if in the new-type/large-cost category

F. Timing of need

G. Others as appropriate

VI. IMPACT OF STAYING WITH THE PRESENT CAPABILITY

-- Ability to meet the projected threat. Impact on combat effectiveness.

— Cost of increasing quantity of existing equipment to meet threat.

— Cost of O&S for existing equipment.

— Other impacts as applicable.

VII. PROGRAM PLAN TO IDENTIFY AND EXPLORE COMPETITIVE ALTERNATIVE SYSTEM CONCEPTS

A. List and briefly describe candidate competitive concepts identified to date, if any. It should be explicitly stated that it is intended to solicit the broadest possible range of qualified sources for candidate system concepts and that all concepts submitted will be evaluated on their merits.

B. Plan for concept phase, up to Milestone I.

C. Plan for establishing a system program office.

VIII. RESOURCES

General statement of manpower, financial resources, and time required to reach Milestone I review.

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